UPDATE TO THE REPORT ON THE CONSERVATION STATUS OF *Arabis fecunda*, A CANDIDATE THREATENED SPECIES

Taxon name:	*Arabis fecunda* Rollins
Common name:	Sapphire rockcress
Family:	Brassicaceae (Cruciferae)
State where taxon occurs:	U.S.A., Montana
Current Federal status:	USFWS Notice of Review, Category 2
Recommended Federal status:	USFWS Notice of Review, Category 2
Author of update:	Lisa Ann Schassberger
Original date of report:	November 15, 1985
Date of most recent revision:	December 19, 1988

Individual to whom further information and comments should be sent:

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This is an abridged report

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V. New Information

21. **Record of revisions:** 19 December 1988; Lisa Ann Schassberger; Topics: I.1.D.; I.2.B.1.b.; I.2.C.1.b.; I.3.E.; I.5.A.; I.5.B.1.; I.6.A.; I.6.B.1.b.; I.6.B.4.; I.6.B.5.; I.6.C.1.; I.6.C.6.; I.7.A.; I.7.B.1.; I.7.B.2.; I.7.C.1.: a., b., c., d., e., f., g., h., i., j., k., l.; I.7.D.4.; I.7.D.6.; I.8.C.2.b.; I.9.A.; I.9.B.; I.9.C.; I.9.D.; I.11.A.1.; II.12.; II.13.A.; II.13.B.1.; II.15.A.1.; II.15.A.2.; II.16; III.17.C.1.; III.17.D.; III.18.; Note: Within the text, numbers in parentheses following site names refer to the three-digit occurrence numbers, see Table 1 (p. 4).

I.1.D. **History and knowledge of taxon:** Since 1985, the sites in the foothills of the Sapphire Range in Ravalli County, Montana were resurveyed. Additional subpopulations were added to the three previously known sites and one new population was discovered. Additionally, eight new populations were located along the north and east flanks of the Pioneer Mountains, in Beaverhead and Silver Bow counties.

I.2.B.1.b. **Other current formal status recommendations:** The status of Arabis fecunda will be changed to "endangered throughout range" (global rank = G2) by the Montana Natural Heritage Program.

I.2.C.1.b. **Other current formal status recommendations:** The status of Arabis fecunda will be changed to "endangered" in Montana (state rank = S2) by the Montana Natural Heritage Program.

I.3.E. **Photographs and line drawings:** The color slides (p.2) are duplicates of those taken at the sites indicated. Additional slides of Arabis fecunda and its habitat are housed at the office of the Montana Natural Heritage Program, Helena, Montana.

I.5.A. **Geographical range:** With the addition of nine new sites, Arabis fecunda is now known to occur at elevations from 4,600-8,000 ft. A new site (1986) from the foothills of the Sapphire Range occurs along Birch Creek in Ravalli County, Montana. The sites discovered in 1988 occur along the Big Hole

6/1988
Arabis fecunda

Vipond Park (011)

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Arabis fecunda 6/1988

Mouth of Jerry Creek (007)

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Arabis Fecunda

2

Lime Gulch (012)

Arabis fecunda 6/1988

Habitat

Mouth of Quartz Hill Gulch (006)

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Arabis fecunda 6/1988

Habitat

Mouth of Jerry Creek (007)

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Arabis Fecunda 6/19

Habitat

Lime Gulch, (012)

Arabis fecunda 6/1988

Habitat

Mouth of Quartz Hill Gulch (006)

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Arabis Fecunda 6/1988

Habitat

Mouth of Quartz Hill Gulch (006)

Lisa A Schassberger

River, and in several smaller drainages on the north and east flanks of the Pioneer Mountains, including: Jerry Creek, Quartz Hill Gulch, Canyon Creek and Birch Creek. These sites fall within Beaverhead and Silver Bow counties, Montana. The new sites along the flanks of the Pioneer Mountains extend the range of this species ca. 75 miles to the southeast. The global distribution for this species is shown on Map 1, p. 4.

I.5.B.1. **Populations currently known extant:**

e. **Montana:** Populations are listed in Table 1, pp. 5-6; exact locations are provided on Maps 2-8, pp. 7-13. All twelve extant populations are included in these tables and maps, as additional subpopulation were discovered for the three sites described in the original report.

I.6.A. **Concise statement of general environment and habitat:** Populations are now known to occur up to 8,000 ft. in elevation.

I.6.B.1.b. **Regional macroclimate:** The long-term weather station nearest to the newly discovered populations in the Pioneer Mountains is at Divide, approximately 11 miles east of the sites, at 5,395 ft. in elevation. For the period from 1951-1980, the July mean temperature was 63.3 ^{o}F, the January mean was 19.1 ^{o}F, and the average annual precipitation was 12.39 in. (Department of Commerce, 1982).

I.6.B.4. **Physiographic and topographic characteristics:** The new sites along the flanks of the Pioneer Mountains occur on the Madison Limestone Formation, comprised of metamorphosed limestone and sandstones, and on the Threeforks Formation, comprised of grayish-brown argillaceous limestone (Richards and Pardee, 1925). These sites appear to be on substrates similar to those occupied by the Sapphire Range populations.

I.6.B.5. **Edaphic factors:** Arabis fecunda may be associated with cryptogamic soil crusts. The initial results of ongoing monitoring and ecological studies in Ravalli County are included in Appendix B, p. 36 (Lesica and

Shelly, 1988). This report details the possible influence of soil crust on this species.

I.6.C.1. **Vegetation, physiognomy and community structure:** Sites in the Pioneer Mountain drainages are often under a very sparse overstory of Juniperus scopulorum (Rocky Mountain juniper), Pseudotsuga menziesii (Douglas fir) and Pinus ponderosa (ponderosa pine). The dominant shrubs are Cercocarpus ledifolius (curly-leaf mountain mahogany) or Artemisia tridentata (big sagebrush). The associated species at the new site in the foothills of the Sapphire Range, Birch Creek Bluffs (004), are similar to those previously reported from that area.

I.6.C.6. **Dependence on dynamic aspects of biotic associations and ecosystem features:** Arabis fecunda may be influenced by the presence and abundance of Centaurea maculosa (spotted knapweed) at the sites along the eastern edge of the Sapphire Mountains. A report on detailed studies of these effects is included in Appendix B, p. 36 (Lesica and Shelly, 1988).

I.7.A. **GENERAL SUMMARY:** Additional subpopulations and/or numbers of plants were recorded for the three sites in the original report. Charleys Gulch (001) now includes thirteen subpopulations and contains approximately 8,000-10,000 plants. Spring Gulch (002) now includes four subpopulations containing approximately 1,000-1,500 plants. Rock Quarry Gulch (003) still consists of only one population, but additional plants were recorded for this site, bringing the total number to approximately 800-1,000. The new Birch Creek Bluffs (004) population has six subpopulations, with approximately 10,000+ plants, within a radius of 3/4 mile.

Populations and subpopulations in the Pioneer Mountain drainages consist of from 75-10,000 plants. These populations are within a radius of ca. 16 miles of one another. The largest distance separating all known populations is ca. 95 miles (between the Lime Gulch (012) site in the Pioneer Mountains, and the Sapphire Mountain populations).

near the Sapphire Range, is contained in Appendix B, p. 36.

I.9.A. **General nature of ownership:** The sites in the Pioneer Mountain drainages are on U.S.D.A. Forest Service, U.S.D.I. Bureau of Land Management, and State of Montana lands.

I.9.B. **Specific landowners:**

1. USDA Forest Service
   Beaverhead National Forest
   610 N. Montana Street
   Dillon, MT 59725

2. USDI Bureau of Land Management
   Headwaters Resource Area
   P.O. Box 3388
   Butte, MT 59702

3. Montana Department of State Lands
   1625 11th Avenue
   Helena, MT 59620

4. Several sites are partially or wholly privately owned. These include:

   Charleys Gulch (001)
   Spring Gulch (002)
   Rock Quarry Gulch (003)
   Birch Creek Bluffs (004)
   Wise River (010)

I.9.C. **Management responsibility:** Same as ownership.

I.9.D. **Easements, conservation restrictions, etc.:** A portion of the Charleys Gulch Site is registered with The Nature Conservancy by the owner (George Frost). Although such registry is not legally binding, the owner agrees to preserve the populations present, and to inform The Nature Conservancy of any proposed land management changes.

I.11.A.1. **Present or threatened destruction, modification, or curtailment of habitat or range:** The Birch Creek Bluffs population (004) may be threatened by weed invasion by Centaurea maculosa (spotted knapweed). The Mouth of Quartz Hill Gulch subpopulation (006) closest to the road is threatened by gravel removal from the base of the hill.

The Jerry Creek population (007) is threatened by grazing and trampling by cattle. The lower portion of the hill where this population occurs was heavily trailed and disturbed.

II.12. **General assessment of vigor, trends and status:** Arabis fecunda is now know from twelve populations, within a radius of ca. 47 miles. Centaurea maculosa (spotted knapweed) is currently not a threat to populations along the flanks of the Pioneer Range, but may pose a threat to the Birch Creek Bluffs site in the foothills of the Sapphire Range. Reproductive output and vigor of Arabis fecunda appears to be normal at the newly discovered sites.

II.13.A. **Recommendation to U.S. Fish and Wildlife Service:** Peter Lesica submitted a petition to list Arabis fecunda just prior to the discovery of the new populations along the flanks of the Pioneer Mountains. Subsequent to these discoveries the petition was retracted. It is recommended that Arabis fecunda be retained in Category 2 until further distribution and ecological studies can be conducted.

II.13.B. **U.S. Forest Service:** Arabis fecunda is now known to occur on lands administered by the U.S. Forest Service. Thus, it should be placed on the list of sensitive species in Region 1 for Montana.

II.15.A. 1. **Recommendations regarding present or anticipated activities:** The effects of mining or increased grazing in areas supporting populations of Arabis fecunda should be assessed before any of these activities are implemented.

2. **Areas recommended for protection:** The Vipond Park site (011) is a large, representative population of Arabis fecunda on Forest Service lands, and should be proposed for special designation. The Quartz Hill site (005), although not yet thoroughly surveyed, is recommended for protection because of its close proximity to two other rare plant populations (Penstemon lemhiensis (Lemhi penstemon) and Claytonia lanceolata var. flava (yellow springbeauty)). Both of these

are USFWS Category 2 taxa and USFS Region 1 sensitive species.

II.16 **Interested parties:**

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III.17.C. 1. **Surveys:**

Steve Shelly, Montana Natural Heritage Program
8 May 1986 (001; Charleys Gulch)
19-20 May 1987
19-20 May 1988
1-3 June 1988

Peter Lesica, The Nature Conservancy

8 May 1986 (001; Charleys Gulch)
27-30 May 1986
19-20 May 1987
19-20 May 1988

Lisa A. Schassberger, Montana Natural Heritage Program

1-3 June 1988
6-7 June 1988
13-15 June 1988

III.17.D. **Knowledgeable individuals:**

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III.18. **Summary of materials on file:** All detailed field forms, maps and color slides are on file at the office of the Montana Natural Heritage Program. Herbarium vouchers for Montana populations will be deposited at the University of Montana Herbarium (MONTU).

Literature Cited

Lesica, P. and J.S. Shelly. 1988. The Ecology of Arabis fecunda: Long-term Monitoring, Knapweed Removal, and Soil Crust Ecology Studies, 1988 Progress Report; unpublished. 16 pp.

Richards, R.W. and J.T. Pardee. 1925. The Melrose Phosphate Field, Montana. U.S.G.S. Bull. 780: 1-32.

U.S. Department of Commerce. 1982. Monthly Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1951-80. National Oceanic and Atmospheric Administration, Climatography of the United States No. 81. 23 pp.

APPENDIX A

APPENDIX B